

second year's course. The first method of proving the inverse square law for magnetic poles will not convince. However, putting aside an occasional criticism of this kind, we think that the book will well serve its purpose of replacing manuscript instruction sheets in a junior laboratory.

OUR BOOK SHELF.

Théorie des Corps déformables. By E. et F. Cosserat. Pp. vi+226. (Paris: A. Hermann et Fils, 1909.) Price 6 francs.

THE authors, who are well known by their writings on general elastic theory, here reprint in separate form an appendix contributed by them to M. Chwolson's "Traité de Physique." The kinematical and dynamical theories of the flexible line, the flexible surface, and the deformable three-dimensional medium are discussed in turn in great detail. The dynamical standpoint adopted is that of the principle of action, which forms, in the authors' opinion, the only satisfactory basis for the "deductive" exposition of the subject. In each case the most general form of the function representing the "action" is sought which is consistent with the necessary invariante relations. This procedure is, of course, not altogether new, and an expert, turning over the pages, will recognise much that in one form or another is familiar to him. The treatment is necessarily somewhat abstract, and is mathematically very elaborate, Cartesian methods being followed throughout. To many readers the long train of general investigations, unrelieved by a single application, may prove deterrent; but the authors at all events claim that their procedure has never before been carried out so resolutely and completely, and may justly pride themselves on the mathematical elegance of their work. Apart from its other qualities, the treatise has a distinct value as a book of reference, and furnishes a whole arsenal of formulæ which may save trouble to future writers.

The book begins with a kind of philosophical introduction to which the authors attach great importance. This requires to be read in conjunction with a previous treatise, which has also appeared in the French edition of M. Chwolson's work. Those who adopt in its fullest extent the empirical view of mechanics will perhaps consider that too much weight is attached to discussions of this kind. The historical references are, however, interesting, and fairly complete. The authors are indeed exceptionally well read in the history of their subject, and admirably conscientious in their citation of authorities. In their preface they promise a subsequent treatment of the theories of heat and electricity from a similar standpoint.

Practical Physiological Chemistry. A Book designed for Use in Courses in Practical Physiological Chemistry in Schools of Medicine and of Science. By Prof. Philip B. Hawk. Second edition, revised and enlarged. Pp. xvi+447. (London J. and A. Churchill, 1909.) Price 16s. net.

PROF. HAWK'S text-book falls into the front rank with the numerous additions and improvements which have been introduced into the new edition. It is not only a practical guide, and, as such, should be found in all physiological laboratories, but forms a very complete, readable, and up-to-date account of our present knowledge of the chemical side of physiology.

A special feature has been made of the illustrations, which are beautifully executed, and most of which will be new to workers in physiological chemistry. The crystalline forms of the many protein derivatives which the work of Emil Fischer and his colleagues

has been instrumental in rendering familiar to the students of this branch of science will be found among them.

One small slip we notice in connection with the matter of protein nomenclature. The initiation of the new system of terminology which is now being adopted for the albuminous substances is wrongly attributed to the British Medical Association. It was really a committee of the Physiological and Chemical Societies of this country which set the ball rolling.

The mistake is, however, a pardonable one, seeing that it was at the meeting of the British Medical Association held at Toronto in 1906 that the opportunity of presenting the subject to our American colleagues was taken advantage of. The success that has attended this effort to secure uniformity of nomenclature amongst English-speaking people has been very gratifying; the American system, adopted under the auspices of the American Physiological Society and the American Society of Biological Chemists, differs in only small and unimportant details from our own.

W. D. H.

Behind the Veil in Bird-land. Some Nature Secrets revealed by Pen and Camera. By Oliver G. Pike, with a number of pen sketches by E. R. Paton. Pp. 106. (London: The Religious Tract Society, 1908.) Price 10s. 6d. net.

SINCE the Keartons, some years ago, showed what splendid results could be achieved by an intelligent use of the camera as an aid to the study of natural history, a host of nature-photographers has arisen, but only a very few have attained the high standard of merit set by the founders of this branch of photography. Mr. R. B. Lodge and Miss E. L. Turner in this country, Schillings in Germany, and H. K. Job in America have in some respects even surpassed the Keartons; while in this display of resource and dogged persistence in the most trying circumstances they stand unrivalled.

Mr. Pike in this rather pretentious volume has given some very excellent photographs, but the "Nature Secrets revealed by Pen and Camera" which he promises in his title-page are conspicuous by their absence. His pages contain hardly one single new fact, but a great deal that is banal. He solemnly assures us, in writing of the kestrel, that "The first summer rose, a delicate pink amidst the surrounding green, is a greater picture of spring than ever the sunlit sea could be"—which statement contains a great deal of truth!—"and," he continues, "a kestrel hovering over a meadow, yellow with summer's flowers, tells us a deeper story than the eagle soaring over a wind-swept moor." We fail to grasp why this should be so.

"Bird-land's veil" is constantly being "lifted up" for him, like the drop-scene at the theatre, and on the stage appear blackbirds, which tell him "the story of the leaves and flowers," and wrens, which reveal "the secrets of the hedgerows," while skylarks, to complete the illusion, like the celebrated Grigolati troupe in the pantomime, fly to and fro across the stage, and sing "happy songs"! Perfectly charming!

W. P. P.

An Account of the Deep-sea Asteroidea collected by the R.I.M.S.S. "Investigator." By Prof. René Koehler. Pp. 143; 13 plates. (Calcutta: Indian Museum, 1909.) Price 12 rupees.

THIS substantial contribution to the material of the echinoderm "system" consists of 126 pages of minute description, and nine pages of general remarks. It is a continuation of certain reports of a preliminary and incentive character published many years ago by the naturalists and pioneers of the Indian Marine Survey, but, except that some doubtful identifications

are disposed of and some errors criticised, it does not incorporate that earlier work.

In the descriptive part of the memoir thirty-nine species are enumerated, of which thirty are regarded as new, and are exhaustively described. The general remarks refer to eighty-eight species—the thirty-nine species treated by the author, and forty-nine species dealt with in the earlier reports—and furnish the evidence of the author's main conclusions. These conclusions are that the deep-sea starfish of the Bay of Bengal and Arabian Sea are much more Phanerozonia than Cryptozonia, and that their geographical affinities, so far as they can be discerned at all, are exclusively Indo-Pacific, with a slight Hawaiian touch.

Of the new species described by Prof. Koehler, five are separated as types of new genera. These are Johannaster, which is placed with very justifiable hesitation among the Plutonasteridae, for some of its characters suggest a pentagonasterid connection; Phidiaster, which seems scarcely distinct from Psilaster; Sidonaster, which agrees in all points with Porcellanaster, except that, as in other porcellanasterid genera, the elements of the cribriform organs are papillar instead of lamellar; and Circeaster and Lydiaster, both of which are Antheneids having the abactinal plates of the disk much smaller than those of the rays.

It may be thought that the limits of some at least of these genera are cut too fine to last; and of the descriptions of species it may almost be said that they are accurate expositions of specimens rather than impressive definitions of nature's products; but such is the way of systematic zoology nowadays.

The memoir is most bountifully and most beautifully illustrated by the author's own hand; the plates, which are thirteen in number, are quite above criticism.

Antimony: its History, Chemistry, Mineralogy, Geology, Metallurgy, Uses, Preparations, Analysis, Production, and Valuation; with complete Bibliographies for Students, Manufacturers, and Users of Antimony. By Chung Yu Wang. Pp. x+217; illustrated. (London: C. Griffin and Co., Ltd., 1909.) Price 12s. 6d. net.

MR. WANG observes in his preface that a metallurgical work in English by a Chinese author is unusual. After reading the book, the conclusion is irresistible that English metallurgists would gain if Chinese authors were more numerous. Mr. Wang has treated his subject with the greatest respect, and has drawn up with methodical care a complete treatise which will be very useful to all students of the subject. The long and apparently exhaustive bibliography at the end of each chapter would alone give the book a right to a place on metallurgists' shelves, but in many cases the facts are sufficiently set forth in the present work.

The author carried out some practical tests of the latest volatilisation process of extracting antimony from its ores, which was patented last year by M. Herrenschildt, and seems to have been much impressed by its merits. The account of these tests is, however, almost the only original matter in the book, which is mainly a compilation of previously published material, printed without comment. Its merits lie chiefly in the logical sequence and the accuracy of the extracts.

Étirage, Tréfilage, Dressage des Produits métallurgiques. By M. Georges Soliman. Pp. 164. (Paris: Gauthier-Villars and Masson et Cie., n.d.) Price 3 francs.

THIS interesting little work, one of the well-known "Aide-Mémoire" series, deals with its subject from a practical point of view. It is divided into five chapters, the first considering shortly the general mechanical properties of metals and alloys such as

tensile, shock, bending, hardness, and torsion tests. Chapter ii. shows the influence of annealing and of cold work. Chapter iii. is devoted to "étrage," or drawing, defined as "an operation which has for its object the completing of work done by rolling and giving to the metal a cross-section which cannot be obtained by rolling," after the manner of wire-drawing ("tréfilage," chapter iv.), which is a special case of drawing where the cross-section is circular. Chapter v. gives a short account of methods of straightening ("dressage"). A. MCW.

Nutrition and Evolution. By Hermann Reinheimer. Pp. xii+284. (London: John M. Watkins, 1909.) Price 6s. net.

THIS is an essay on the importance of nutrition as a factor in evolution, and the author is in good company. For was it not Claude Bernard who said, "l'évolution, c'est l'ensemble constant de ces alternatives de la nutrition; c'est la nutrition considérée dans sa réalité, embrassée d'un coup d'œil à travers le temps"? To have had this thesis worked out in a methodical manner would have been great gain, but the author is not strong in scientific method. He has gleaned far and wide to illustrate "the evolutionary aspects of nutrition," and while he has a crow to pick with most of his authorities, who have not the "central key of a uniform analysis," he uses them when they suit him to back up his conclusion "that in its silent effects nutrition is one of the most formidable factors in the shaping of individual and racial destinies." The conclusion is sound, but we cannot say this of many of the arguments.

LETTERS TO THE EDITOR.

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Bessel's Functions.

I ONCE stated that a good style of writing English is not a strong point amongst British mathematicians, and the justice of this remark is exemplified by Prof. Hill's letter on this subject (NATURE, July 8), since it contains the phrases Meissel's tables, Smith's tables, Aldis' tables, Isherwood's tables, which are correct; and Bessel functions, British Association tables, which are wrong. It is not in general permissible in English to employ a proper noun as an adjective, for the rules of grammar require either the use of the genitive case, or the conversion of the noun into an adjective, as in the words Newtonian, Lagrangean.

The British Association is one of the most important societies in the British Empire; it long ago discarded the insularity of our ancestors, and has become cosmopolitan in its operations. It is therefore not too much to expect that it will conform to the rules of grammar in its publications, and employ its influence in encouraging a good literary style.

I do not understand what Prof. Hill means by Neumann's functions. I believe that Neumann was the first mathematician who studied the properties of zonal harmonics and allied functions of degree $n + \frac{1}{2}$, where n is zero or a positive integer; but the subject was afterwards taken up and greatly extended by Prof. W. M. Hicks in connection with circular vortex motion. Hicks calls these harmonics *toroidal functions*, which is a much better phrase, since it puts in evidence the fact that these functions are connected with the potentials of *anchor rings* or *tores*.

There is also another class of functions which are zonal harmonics of complex degree $m - \frac{1}{2}$. These have been studied by Hobson (*Trans. Camb. Phil. Soc.*, vol. xiv., p. 211), who calls them *conal harmonics*.

A. B. BASSET.

Fledborough Hall, Holport, Berks, July 9.